

GENERIC AFFINITIES AND TYPIIFICATION OF ELEVEN SPECIES EXCLUDED
FROM *SIPHONOGLOSSA* OERST. (ACANTHACEAE)

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ABSTRACT

The genus *Siphonoglossa* Oerst., as recently delimited, includes only ten taxa belonging to the typical section. This delimitation of *Siphonoglossa sensu stricto* is warranted because several misconceptions concerning the vegetative and pollen morphology of the genus have been disclosed. Of the taxa excluded from the genus, most may properly belong to the closely related genus *Justicia* L., while others do not belong to the same tribe as *Siphonoglossa* and *Justicia*.

KEY WORDS: *Siphonoglossa*, *Justicia*, Acanthaceae, pollen, typification, systematics.

The genus *Siphonoglossa*, previously comprising 25 species, has long been subject to erroneous concepts as to its proper delimitation. As such, it became an artificial assemblage of species having little affinity to each other or to the original concept of the genus as based on the generitype (Oersted 1854). Several of these species do not even belong together at the tribal (or subtribal) level. This was shown by Hilsenbeck (1983), who narrowed the concept of *Siphonoglossa* to ten taxa in seven species belonging to the strictly New World type section (see Henrickson & Hilsenbeck 1979). It is therefore necessary to exclude the remaining 15 taxa from the genus, and this study concerns the treatment of 11 of these. The purpose of this paper, then, is to present the generic and tribal affinities of the taxa erroneously classified in *Siphonoglossa* and to discuss their typification since some of the types were either destroyed or not designated. Additionally, it is felt that considerable nomenclatural and taxonomic confusion surrounding the genus will be significantly reduced by the following account.

Six of the species here excluded from *Siphonoglossa* are African in distribution and, though belonging to the same tribe and subtribe as *Siphonoglossa* (Justicieae Lindau, Justiciinae Bremekamp), clearly do not belong to *Siphonoglossa* as recently delimited. The six species have an equally 5 parted calyx and conspicuously appendaged anther sacs, among other characters, which

strongly ally them with *Justicia* and the taxa referred to *Siphonoglossa* section *Pentaloba* Hilsenbeck (in Henrickson & Hilsenbeck 1979). Because the four taxa of *Siphonoglossa* section *Pentaloba* [type, *S. pilosella* (Nees) Torrey] possess morphological, chemical and cytological characteristics of *Justicia* rather than *Siphonoglossa*, they are to be formally transferred to *Justicia* (Hilsenbeck 1983; 1989a) and will not be dealt with further here.

All of the above taxa were placed in *Siphonoglossa* under what I have termed the artificial "Torreyan concept" of the genus as discussed elsewhere (Hilsenbeck 1983; 1989a). In short, Torrey (1859) widened considerably the limits of *Siphonoglossa* (type, *S. ramosa* Oerst.) by transferring into the genus an American species known for years to European botanists as *Adhatoda dipteracantha* Nees (= *Monechma pilosella* Nees), calling it *S. pilosella*. To accommodate this species, Torrey had to enlarge Oersted's original concept of *Siphonoglossa* to include characters that traditionally define the genus *Justicia* (see Leonard 1958; Long 1970). The inclusion in *Siphonoglossa* of *S. pilosella*, and later the African species *S. tubulosa* (E. Meyer) Bentham & Hooker [= *Adhatoda tubulosa* (E. Meyer) Nees] by Bentham (in Bentham & Hooker 1886), set a precedent for other taxonomists, particularly Moore, to classify elements in the genus based primarily on direct comparisons with *S. pilosella* (not *S. ramosa*) as representative of the genus. For example, in his description of *S. rubra*, Moore (1906), employing the Torreyan concept of the genus, states, "This plant. . . found in Tropical Africa, is quite unlikely any of its American and South African congeners. The flower has been compared carefully with that of *S. pilosella* Torr., and found to agree with it in all essentials of generic nature."

Excluded also here are five New World species placed in *Siphonoglossa* by Lindau. All of these species were so classified based on Lindau's misconception of the pollen morphology of the group as discussed elsewhere (Hilsenbeck 1983; 1989b). These five species properly belong in the tribe Odontonemeae Lindau, not in Justicieae, or following Bremekamp's (1965) system, they would be placed in Justicieae, subtribe Odontoneminae. For example, on transferring *Carlwrightia pringlei* Robins. & Greenm. to *Siphonoglossa*, Lindau (1897) states that the species, "ist eine typische *Siphonoglossa* wie aus der Form der Corolla und dem Pollen (Spangpollen) hervorgeht." Spangpollen is pollen that is basically prolate and tricolporate and is generally characteristic of Odontoneminae. The taxa of Justiciinae, including *Siphonoglossa sensu stricto* (Hilsenbeck 1983), are characterized by pollen that Lindau (1894; 1895) termed Knötchenpollen. This latter type of pollen is most often bilateral and 2 porate.

Therefore, all 11 species here excluded from *Siphonoglossa* were placed in the genus either upon: 1) the very broad and artificial "Torreyan concept" and are, for the most part, thus referable to *Justicia* or, 2) a misconception of pollen morphology and as such belong to a different tribe (or subtribe) of

Acanthaceae. I will not make the generic transfer of any of these species at this time, because I feel that they should be accorded more detailed study prior to their formal inclusion within other genera. It is clear, however, that these 11 species do not belong to *Siphonoglossa* as based on the type, *S. ramosa*.

EXCLUDED SPECIES

Siphonoglossa gentianifolia Lindau, Bull. Herb. Boissier 2:370. 1905. TYPE: PARAGUAY: Gran Chaco prope Santa Elisa ad marginem silvarum, w/o date, Hassler 2841 (HOLOTYPE: B, destroyed; Phototypes: GH!,NY!).

In the description of this taxon Lindau states, "pollinis granula, subglobosa, typica" in direct reference to this species having Spangpollen which Lindau mistakenly believed typical for the genus. Judging from the description and type photographs, this species is very closely related to another of Lindau's "siphonoglossas," as he states, "Verwandt mit *S. sulcata* (Nees) Lindau, aber durch die grosseren und viel breiteren Blatter, die kurzeren Blumen und die breiteren Brakteen sofort zu unterscheiden." The proper generic disposition of this taxon, of which the only material I have seen are the photos, will be discussed under *S. sulcata*. I have been unable to locate other specimens of Hassler 2841 on which to base a lectotype, and in the absence of other authentic material I cannot properly designate a neotype.

Siphonoglossa glabrescens Lindau, Bull. Herb. Boissier 2:546. 1894. TYPE: MÉXICO, Oaxaca: distr. Tlacolula, prope Zoquitlan, Jun 1888, Seler 76 (HOLOTYPE: B, destroyed; Phototypes: GH!,MICH!,NY!).

That this species is not a *Siphonoglossa* is plainly evident. The pollen was described by Lindau as "pollinis granula typica" again in allusion to its prolate, tricolporate nature (i.e., Spangpollen). From the description and the photo of the type, it is clear that this taxon is in reality *Anisacanthus quadrifidus* (Vahl) Nees. Among other features, the species has a red corolla, the morphology of which is that of *Anisacanthus*, and conspicuously exfoliating bark also characteristic of that genus.

Siphonoglossa (?) *linifolia* (Lindau) C.B. Clarke, in W.T. Thiselton-Dyer, ed., *Flora Capensis* vol. 5, sect. 1:75. 1912. *Aulojusticia linifolia* Lindau, Bot. Jahrb. Syst. 24:325. 1898. LECTOTYPE (here chosen): SOUTH AFRICA: Kalahari Region, Transvaal, mountain sides of Saddleback Range, near Barberton, 22 Feb 1890, E. E. Galpin 825 (BOL!; Isolectotypes: NBG!,US!).

The holotype, Galpin 825 at Berlin, was destroyed. Therefore, Galpin 825 at BOL, an isotype, is designated as lectotype. The only vague resemblance that this South African species bears to *Siphonoglossa* is a very long corolla tube. The calyx is equally 5 parted, the anthers are conspicuously appendaged, and in habit and characters of the fruit, this taxon is not congeneric with *Siphonoglossa*. In transferring this species to *Siphonoglossa*, Clarke placed a question mark between the generic and specific epithets and earlier states, "The question is greatly complicated by the arrival of a third South African species (*Aulojusticia linifolia*) which has the corolla of *Beleropone* (he must have meant *Beloperone*), not of *Siphonoglossa*." Even as widely as Lindau stretched the generic boundaries of *Siphonoglossa*, he did not place this species in it, instead erecting a new genus, *Aulojusticia*, to accommodate it. I am in favor of leaving this distinctive species in Lindau's monotypic genus until future study can perhaps better determine its generic affinities.

Siphonoglossa macleodiae S. Moore, in Macleod, *Chiefs & Cities Centr. Afr.* 304. 1912. TYPE: NIGERIA: N Nigeria, River Benue, Sep 1910, P. A. Talbot s.n. (HOLOTYPE: BM!; Isotype: MO!).

This species clearly belongs to *Justicia* subgenus *Eujusticia*, near sections *Adhatoda* and *Tyloglossa* of Lindau (1895), because of its flowers borne solitary and sessile in the leaf axils, equally 5 parted calyx, and spurred anther sacs. An illustration of the pollen is affixed to the holotype showing that this species has Knötchenpollen.

Siphonoglossa migeodii S. Moore, *J. Bot.* 67:271. 1929. TYPE: TANZANIA: Tanganyika Terr., w/o date, *F.W.H. Migeod 137* (HOLOTYPE: BM!).

From all appearances, the relationships of this species clearly lie with the other African elements which have been mistakenly included in *Siphonoglossa*. It may be that the only extant material of this species is that of the type collection and two paratypes (*Migeod 479*, BM) as I have not seen any other specimens of this taxon, even from the South African herbaria from which I borrowed material. As with *S. macleodiae*, the proper classification of this little known species should await further study directed primarily at these Old World taxa. It appears, however, that this species has affinities with *Aulojusticia linifolia* through its corolla, inflorescence and fruit morphology, as well as with *Justicia* in its 5 parted calyx and conspicuously spurred lower anther sac.

Siphonoglossa nummularia S. Moore, *J. Bot.* 18:40. 1880. TYPE: SOUTH AFRICA: "British Kaffraria," 1860, *T. Cooper 370* (HOLOTYPE: K!).

As noted above, Moore accepted, followed, and even expanded upon Torrey's artificial concept of the genus. Indeed, *S. nummularia* with its 5 parted

calyx and spurred lower anther sacs fits well within *Justicia*, not *Siphonoglossa*. Its most closely allied taxa appear to be the other South African "siphonoglossas" and section *Pentaloba* of *Siphonoglossa* which is currently being transferred to *Justicia* (Hilsenbeck 1989a).

Siphonoglossa peruviana Lindau, Bot. Jahrb. Syst. 42:173. 1908. TYPE: PERÚ. Amazonas: Prov. Chachapoyas, östliche Talwand des Marañon über Balsas, w/o date, A. Weberbauer 4269 (HOLOTYPE: B, destroyed; Phototypes: GH!, NY!).

As with the other taxa placed in *Siphonoglossa* by Lindau, this species has Spangpollen and thus more properly belongs in Odontomeae. The type material unfortunately has been destroyed and I cannot locate any other material of *Weberbauer 4269* with which to lectotypify this species. On initial inspection, it appears that *S. peruviana* may belong in the genus *Yeatesia*, having a very similar overall inflorescence and corolla morphology to this genus (Hilsenbeck 1989c). From the original and rather detailed description of the fruit and seeds, and the type photos, however, this species undoubtedly belongs in *Tetramerium* and Daniel (1986) has recently and correctly made the formal transfer.

Siphonoglossa pringlei (Robins. & Greenm.) Lindau, Bull. Herb. Boissier 5:622. 1897. BASIONYM: *Carlwrightia*(?) *pringlei* Robins. & Greenm., Proc. Amer. Acad. Arts 32:40. 1896. TYPE: MÉXICO. Oaxaca: dry slopes Tomellin Cañon, 30 Nov 1895, C.G. Pringle 6261 (HOLOTYPE: GH!; Isotype: CAS!).

This species has Spangpollen and as such should be in the Odontomeae, well removed from *Siphonoglossa*. In his monographic treatment of *Carlwrightia*, Daniel (1980) included this species under *Carlwrightia* where it correctly belongs.

Siphonoglossa rubra S. Moore, J. Bot. 44:88. 1906. TYPE: UGANDA: Entebbe, w/o date, *Bagshawe 750* (BM).

Although Moore states that the type of this species is at BM, I did not receive any material of it in a loan from BM that contained the holotypes of two other African species placed by Moore in *Siphonoglossa*. I have not seen, nor do I know the location of any material of *Bagshawe 750* and have, therefore, been unable to properly lectotypify the species. I have, however, examined several other specimens of this seemingly polytypic, red flowered species. As stated above, Moore carefully compared the flowers of *S. rubra* and *S. pilosella* and found them to agree "in all essentials of generic nature." It is indeed true that these two taxa have a similar "flower" morphology, including androecium structure, an equally 5 parted calyx and other features in common. However,

in characters of the inflorescence, corolla, fruit and seed, *S. rubra* more closely resembles the widespread tropical African and Asian *Rhinacanthus nasutus* (L.) Lindau (= *R. communis* Nees). Though clearly not a *Siphonoglossa*, it perhaps does belong in *Rhinacanthus*, but as with the other African taxa herein discussed, its proper generic disposition should await further investigation.

Siphonoglossa sulcata (Nees) Lindau, Bot. Jahrb. Syst. 48:19. 1894. BASIONYM: *Jacobinia sulcata* Nees in DC., Prodr. 11:333. 1847. *Dianthera sulcata* (Nees) Griseb., Goett. Abh. 19:224. TYPE: ARGENTINA: Río Parana, w/o date, Tweedie s.n. (HOLOTYPE: K!).

This species is clearly not related to *Siphonoglossa* but instead has a very close affinity to the genus *Yeatesia* Small, tribe Odontonemeae, of the southern United States and adjacent northeastern México (Hilsenbeck 1983; 1986c). This species and *S. gentianifolia* possess Spangpollen and also have inflorescences, corollas, androecia, fruits and seeds characteristic of *Yeatesia* and the Old World genus *Ecbolium* and are clearly most closely related to (besides each other) these two genera. The proper generic classification of these species is under active consideration.

Siphonoglossa tubulosa (Nees) Benth & Hooker, Gen. Pl. 2:1110. 1886.

This combination should properly be *S. tubulosa* (E. Meyer) Benth & Hooker, but is cited here as listed by Benth & Hooker (1886). BASIONYM: *Justicia tubulosa* E. Meyer in Drege, Zwei Pflanzengeogr. Documente 150,196. 1837. *Rhinacanthus tubulosus* (E. Meyer) Presl, Bot. Bemerk. 95. 1843. *Adhatoda tubulosa* (E. Meyer) Nees in DC., Prodr. 11:392. 1847. LECTOTYPE (here chosen): SOUTH AFRICA: Pondoland between St. Johns River and Umtsikaba River, 1837, S.F. Drege s.n. (K!; Isolectotypes: K!,MO!).

Justicia suffruticosa E. Meyer in Drege, Zwei Pflanzengeogr. Documente 153, 196. 1837.

Justicia prostrata Schlechtend. ex Nees in DC., Prodr. 11:390. 1847.

Gendarussa leptantha Nees, Linnaea 15:372. 1841. *Adhatoda leptantha* (Nees) Nees in DC., Prodr. 11:392. 1847. *Justicia leptantha* (Nees) Lindau in Engl. & Prantl, Naturl. Pflanzenfam. 4, 3b:349. 1895.

Of the three sheets of this collection at K, two have been annotated by Nees von Esenbeck, and of these two, the most complete specimen has been chosen as lectotype. I think that this species most properly belongs in *Justicia* or in *Adhatoda*, if one accepts the latter genus. It is notable that Nees (1847) placed this species in the same genus with *Adhatoda hyssopifolia* (L.) Nees (= *Justicia hyssopifolia* L.) and *Adhatoda dipteracantha* Nees [= *Siphonoglossa pilosella* (Nees) Torrey]. *Justicia hyssopifolia* is one of the two proposed lectotypes of the genus *Justicia* (Stearn 1971). This points clearly to the close

affinity of *S. pilosella*, not only with *Justicia* (and *Adhatoda*), but with the African taxa improperly placed in *Siphonoglossa*. An instructive commentary concerning the generic status of this species was that of Clarke (1912). He states, "*S. tubulosa* was removed from *Justicia* to the American genus *Siphonoglossa* by Bentham (Benth. *et* Hooker, *f.* Gen. Pl. ii. 1110). S. Moore added *S. nummularia* which is beyond question congeneric with *S. tubulosa*. Baillon (Hist. de Plantes, X. 441) records *S. tubulosa* under *Siphonoglossa* but does not appear to have examined or considered it. Lindau (in Engl. & Prantl., Pflanzenfam. IV. 3B, 338) says that these two species can scarcely be referred to *Siphonoglossa* and (*l.c.* p. 349) records *S. tubulosa* (under a different name) as a true *Justicia*." I agree with Clarke that *S. tubulosa* and *S. nummularia* are closely related, if not congeneric. I also agree with Lindau that these taxa should be excluded from *Siphonoglossa* (but for a different reason) and placed in *Justicia*, the former as *J. tubulosa* E. Meyer.

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